

## CLAIM AMENDMENTS

### Claim Amendment Summary

#### Claims pending

- At time of the Action: Claims 1, 4-9, 12-24, 26-28 and 35-41.
- After this Response: Claims 1, 4-9, 12-24, 26-28 and 35-41.

**Canceled or Withdrawn claims:** none

**Amended claims:** 1, 7, 9, 14, 18-22, 24 and 35.

**New claims:** none.

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### Claims:

1. (CURRENTLY AMENDED) A method for concealing data within a digital signal, the method comprising:

receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message;

imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposing is carried out by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern;

processing the digital signal into a series of bitframes, wherein each bitframe includes a set of frames, and wherein each frame includes a set of blocks;  
and

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atty: Kasey C. Christie

1 encoding ~~a third~~ the third data pattern into the digital signal, ~~wherein such~~  
2 ~~third data pattern is the result of the imposing~~ wherein a different bit of the  
3 watermark is encoded in each frame of at least one subject bitframe, and wherein a  
4 same bit of the covert message is encoded in each frame of the subject bitframe.

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6 2. (CANCELED)

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8 3. (CANCELED)

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10 4. (PREVIOUSLY PRESENTED) A method as recited in claim 1,  
11 wherein the Boolean operation is XOR.

12  
13 5. (PREVIOUSLY PRESENTED) A method as recited in claim 1,  
14 wherein

15 a pattern of discrete values may be encoded into the digital signal in one of  
16 multiple discrete states;

17 the imposing comprises encoding multiple values of the first data pattern  
18 into the digital signal into a state that indicates a single discrete value of the  
19 second data pattern.

20  
21 6. (PREVIOUSLY PRESENTED) A method as recited in claim 1,  
22 wherein the digital signal is selected from a group consisting of a digital audio  
23 signal, a digital video signal, a digital image signal, and a digital multimedia  
24 signal.

1           7.     (CURRENTLY AMENDED) A method as recited in claim 1, wherein  
2     ~~the first data pattern is a watermark~~ the different bit of the watermark which is  
3     encoded in a respective frame of the subject bitframe, is repeated in each block of  
4     the respective frame.

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6           8.     (PREVIOUSLY PRESENTED)     A computer having a computer-  
7     readable medium as recited in claim 18.  
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atty: Kasey C. Christie

1           9.    (CURRENTLY AMENDED) A method for revealing a covert data  
2 pattern of discrete values from an encoded data pattern of discrete values in a  
3 digital signal, the method comprising:

4           receiving a digital signal, the digital signal being segmented into a series of  
5 bitframes which each include a set of frames, the signal having a watermark  
6 encoded therein, the watermark being an encoded data pattern of discrete values is  
7 encoded into the signal in one of multiple discrete states, the encoded data pattern  
8 representing multiple data patterns comprising an original watermark data pattern  
9 and a covert data pattern; the digital signal having an encoded data pattern of  
10 discrete values representing a first data pattern of discrete values which are bits of  
11 a watermark, a different bit of the watermark encoded in each frame of at least one  
12 subject bitframe, and a covert data pattern of discrete values which are bits of a  
13 covert message, a same bit of the covert message encoded in each frame of the  
14 subject bitframe; and

15           extracting a discrete value of the covert data pattern from a plurality of  
16 values of the encoded data pattern, wherein the extracting is carried out by  
17 decoding a single discrete value of the covert data pattern from the digital signal  
18 based upon a state of a multiple discrete values of the encoded data pattern.  
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20           10.   (CANCELED)

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22           11.   (CANCELED)

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atty: Kasey C. Christie

12. (PREVIOUSLY PRESENTED) A method as recited in claim 9, wherein the digital signal is selected from a group consisting of a digital audio signal, a digital video signal, a digital image signal, and a digital multimedia signal.

13. (PREVIOUSLY PRESENTED) A computer having a computer-readable medium as recited in claim 19.

14. (CURRENTLY AMENDED) A method for encoding a watermark with a covert message into a digital audio signal, ~~wherein binary bits of the watermark may be encoded into the signal in multiple states~~, the method comprising:

encoding multiple binary bits of the watermark into frames of at least one subject bitframe of the digital signal, a different one of the multiple binary bits encoded into each of the frames, the multiple binary bits encoded into the digital signal in multiple states; and

encoding a binary bit of the covert message over all the frames of the subject bitframe of the digital signal, the binary bit of the covert message indicating into a state that indicates a single discrete value of the covert message.


15. (ORIGINAL) A method as recited in claim 14, wherein the multiple states are positive or negative modifications to magnitudes of one or more subbands in the frequency spectrum of a sample of the signal.

1           **16. (PREVIOUSLY PRESENTED)**       A method for imposing a covert  
2 message into a watermark, the method comprising:

3           generating multiple watermarks;  
4           assigning each of the multiple watermarks to each of the possible discrete  
5 values for at least a portion of the covert message;  
6           selecting a watermark that corresponds to an actual discrete value of at least  
7 a specific portion of the covert message;  
8           without encoding any portion of the covert message itself into a digital  
9 signal, encoding the selected watermark into the digital signal.

10  
11           **17. (PREVIOUSLY PRESENTED)**       A method as recited in claim 16,  
12 wherein

13           size of all portions of the covert message is N bits long;  
14           number of the multiple watermarks is  $2^N$ .

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atty: Kasey C. Christle

1 18. (CURRENTLY AMENDED) A computer-readable medium having  
2 computer-executable instructions that, when executed by a computer, perform a  
3 method for concealing data within a digital signal, the method comprising:

4 receiving a first data pattern of discrete values which are bits of a  
5 watermark and a second data pattern of discrete values which are bits of a covert  
6 message;

7 imposing a discrete value of the second data pattern over one or more  
8 discrete values of the first data pattern to generate a third data pattern, wherein the  
9 imposing is carried out by performing a Boolean operation with a discrete value of  
10 the second data pattern and multiple discrete values of the first data pattern;

11 processing the digital signal into a series of bitframes, wherein each  
12 bitframe includes a set of frames, and wherein each frame includes a set of blocks;  
13 and

14 encoding the third data pattern into the digital signal, ~~wherein such third~~  
15 ~~data pattern is the result of the imposing~~ wherein a different bit of the watermark  
16 is encoded in each frame of at least one subject bitframe, and wherein a same bit  
17 of the covert message is encoded in each frame of the subject bitframe.

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1           19. (CURRENTLY AMENDED) A computer-readable medium having  
2 computer-executable instructions that, when executed by a computer, perform a  
3 method for revealing a covert data pattern of discrete values from an encoded data  
4 pattern of discrete values in a digital signal, the method comprising:

5           receiving a digital signal, the digital signal being segmented into a series of  
6 bitframes which each include a set of frames, the signal having a watermark  
7 encoded therein, the watermark being an encoded data pattern of discrete values is  
8 encoded into the signal in one of multiple discrete states, the encoded data pattern  
9 representing multiple data patterns comprising an original watermark data pattern  
10 and a covert data pattern; the digital signal having an encoded data pattern of  
11 discrete values representing a first data pattern of discrete values which are bits of  
12 a watermark, a different bit of the watermark encoded in each frame of at least one  
13 subject bitframe, and a covert data pattern of discrete values which are bits of a  
14 covert message, a same bit of the covert message encoded in each frame of the  
15 subject bitframe; and

16           extracting a discrete value of the covert data pattern from a plurality of  
17 values of the encoded data pattern, wherein the extracting is carried out by  
18 decoding a single discrete value of the covert data pattern from the digital signal  
19 based upon a state of a multiple discrete values of the encoded data pattern.

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1           20. (CURRENTLY AMENDED) An apparatus comprising:

2           a processor;

3           a covert-channel-encoder executable on the processor to:

4                 receive a first data pattern of discrete values which are bits of a  
5                 watermark and a second data pattern of discrete values which are bits of a covert  
6                 message;

7                 impose a discrete value of the second data pattern over one or more  
8                 discrete values of the first data pattern to generate a third data pattern, wherein the  
9                 imposition is carried out by performing a Boolean operation with a discrete value  
10                of the second data pattern and multiple discrete values of the first data pattern;

11                process the digital signal into a series of bitframes, wherein each  
12                bitframe includes a set of frames, and wherein each frame includes a set of blocks;  
13                and

14                encode the third data pattern into the digital signal, ~~which third data~~  
15                ~~pattern is based upon the result of the imposing~~ wherein a different bit of  
16                the watermark is encoded in each frame of at least one subject bitframe, and  
17                wherein a same bit of the covert message is encoded in each frame of the  
18                subject bitframe.

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atty: Kasey C. Christie

1           **21. (CURRENTLY AMENDED)** An apparatus comprising:

2           a processor;

3           a covert-channel-decoder executable on the processor to:

4                 receive a digital signal, the digital signal being segmented into a  
5 series of bitframes which each include a set of frames, the signal having a  
6 watermark encoded therein, the watermark being an encoded data pattern of  
7 discrete values is encoded into the signal in one of multiple discrete states, the  
8 encoded data pattern representing multiple data patterns comprising an original  
9 watermark data pattern and a covert data pattern; the digital signal having an  
10 encoded data pattern of discrete values representing a first data pattern of discrete  
11 values which are bits of a watermark, a different bit of the watermark encoded in  
12 each frame of at least one subject bitframe, and a covert data pattern of discrete  
13 values which are bits of a covert message, a same bit of the covert message  
14 encoded in each frame of the subject bitframe; and

15                 extract a discrete value of the covert data pattern from a plurality of  
16 values of the encoded data pattern, wherein the extracting is carried out by  
17 decoding a single discrete value of the covert data pattern from the digital  
18 signal based upon a state of a multiple discrete values of the encoded data  
19 pattern.  
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att: Kasey C. Christle

1           22.   (CURRENTLY AMENDED) A data encoding system for concealing  
2 data within a digital signal, the system comprising:

3           a receiver for receiving a first data pattern of discrete values which are bits  
4 of a watermark and a second data pattern of discrete values which are bits of a  
5 covert message;

6           an imposer coupled to such receiver, the imposer for imposing a discrete  
7 value of the second data pattern over one or more discrete values of the first data  
8 pattern to generate a third data pattern, wherein the imposing is carried out by  
9 performing a Boolean operation with a discrete value of the second data pattern  
10 and multiple discrete values of the first data pattern;

11           an encoder coupled to the receiver and the imposer, the encoder for  
12 inserting within the digital signal one or more values of ~~a-third~~ the third data  
13 pattern which are results of the imposer's imposing a discrete value of the second  
14 data pattern over one or more values of the first data pattern, wherein a different  
15 bit of the watermark is encoded in each frame of at least one subject bitframe, and  
16 wherein a same bit of the covert message is encoded in each frame of the subject  
17 bitframe.

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19           23.   (PREVIOUSLY PRESENTED)       An operating system embodied on  
20 a computer-readable medium having at least one program module comprising an  
21 encoding system as recited in claim 22.  
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1           24. (CURRENTLY AMENDED) A marked signal embodied on a  
2 computer-readable medium, the marked signal having an encoded data channel  
3 therein, wherein such encoded data channel has a covert data channel imposed  
4 therein, the marked signal generated in accordance with the following acts:

5           receiving an original watermark data pattern of discrete values which are  
6 bits of a watermark and a covert data pattern of discrete values which are bits of a  
7 covert message;

8           imposing a discrete value of the covert data pattern over one or more  
9 discrete values of the watermark data pattern to generate a third data pattern,  
10 wherein the imposing is carried out by performing a Boolean operation with a  
11 discrete value of the covert data pattern and multiple discrete values of the  
12 watermark data pattern;

13           processing a digital signal into a series of bitframes, wherein each bitframe  
14 includes a set of frames, and wherein each frame includes a set of blocks; and

15           ~~encoding results of the imposing within an unmarked signal to produce the~~  
16 ~~marked signal~~ the third data pattern into the digital signal to generate the marked  
17 signal, wherein a different bit of the watermark is encoded in each frame of a at  
18 least one subject bitframe, and wherein a same bit of the covert message is  
19 encoded in each frame of the subject bitframe.

20  
21           25. (CANCELED)

22  
23           26. (PREVIOUSLY PRESENTED) A marked signal as recited in  
24 claim 24, wherein the Boolean operation is XOR.

1           **27. (PREVIOUSLY PRESENTED)**       A marked signal as recited in  
2 claim 24, wherein

3           a pattern of discrete values may be encoded into the signal in one of  
4 multiple discrete states;

5           the imposing comprises encoding multiple values of the watermark data  
6 pattern into the digital signal into a state that indicates a single discrete value of  
7 the covert data pattern.

8  
9           **28. (PREVIOUSLY PRESENTED)**       A marked signal as recited in  
10 claim 24, wherein the marked signal is selected from a group consisting of a  
11 digital audio signal, a digital video signal, a digital image signal, and a digital  
12 multimedia signal.

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14           **29. (CANCELED)**

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16           **30. (CANCELED)**

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18           **31. (CANCELED)**

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20           **32. (CANCELED)**

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22           **33. (CANCELED)**

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24           **34. (CANCELED)**

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atty: Kasey C. Christie

1           **35. (CURRENTLY AMENDED)**           A method for concealing data  
2 within a digital signal, the method comprising:

3           receiving a first data pattern of discrete values which are bits of a  
4 watermark and a second data pattern of discrete values which are bits of a covert  
5 message;

6           , imposing a single discrete value of the second data pattern on a plurality of  
7 values of the first data pattern, wherein the imposing encodes a third data pattern  
8 into the digital signal, wherein a different bit of the watermark is encoded in each  
9 frame of at least one subject bitframe of the digital signal, and wherein a same bit  
10 of the covert message is encoded in each frame of the subject bitframe of the  
11 digital signal.

12  
13           **36. (PREVIOUSLY PRESENTED)**           A method as recited in  
14 claim 35, wherein the imposing comprises performing a Boolean operation with a  
15 discrete value of the second data pattern and a plurality of values of the first data  
16 pattern.

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18           **37. (PREVIOUSLY PRESENTED)**           A method as recited in  
19 claim 35, wherein the imposing comprises XORing a discrete value of the second  
20 data pattern with a plurality of values of the first data pattern.

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1           **38. (PREVIOUSLY PRESENTED)**           A method as recited in  
2 claim 35, wherein

3           a pattern of discrete values may be encoded into the digital signal in one of  
4 multiple discrete states;

5           the imposing comprises encoding a plurality of values of the first data  
6 pattern into the digital signal into a state that indicates a single discrete value of  
7 the second data pattern.

8  
9           **39. (PREVIOUSLY PRESENTED)**           A method as recited in  
10 claim 35, wherein the digital signal is selected from a group consisting of a digital  
11 audio signal, a digital video signal, a digital image signal, and a digital multimedia  
12 signal.

13  
14           **40. (PREVIOUSLY PRESENTED)**           A method as recited in  
15 claim 35, wherein the first data pattern is a watermark.

16  
17           **41. (PREVIOUSLY PRESENTED)**           A computer-readable  
18 medium having computer-executable instructions that, when executed by a  
19 computer, performs the method as recited in claim 35.

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